VOL. LXI · No. 3 MAY-JUNE, 1958

ANIMAL KINGDOM

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ANIMAL KINGDOM

Bulletin of the New York Zoological Society

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Vol. LXI JUNE 1958 **No. 3**

Issued bi-monthly at the Offices of the New York Zoological Society, 30 East Fortieth Street, New York 16, N. Y. Editorial and Subscription Offices, Zoological Park, Bronx Park, New York 60, N. Y. Title registered with United States Patent Office • Subscription, $3.50 a year; single copy, 60 cents. Same rates for all foreign countries and Canada. All pictures not otherwise credited are from the photographic collection of the New York Zoological Society.

The World at the Zoo

SOMETIMES AN EPISODE, perhaps of no great importance in itself, assumes a vivid significance.

The other day our Zoological Park had the privilege of playing host to representatives of the United Nations — ambassadors, ministers, councilors, chargés d'affaires — some seventy men and women in all. They came from countries far distant one from another: from Indonesia, from South America, from the Sudan, from Europe, from Iraq, Liberia, Jordan, the Philippines, Nepal and Yemen. Their present tasks center in a tall edifice in mid-Manhattan where each day they play a part, large or small, in endeavoring to resolve the conflicts and problems of the modern world.

There was magic in the day which cast its spell over everyone. For once, one felt that the problems of mankind had flown away into the bright May air. It seemed that conflicts between countries must indeed be imaginary, for on this day there was complete mutuality in the enjoyment of observing animals and contemplating the wonders of nature. For a while at least it was impossible that there could be friction between man and man.

Fairfield Osborn

Olaf:

1,000 Pounds of Walrus Charm

By CHRISTOPHER W. COATES

&

JAMES W. ATZ

AMONG THE HUNDREDS OF THOUSANDS of animals exhibited by the New York Aquarium in the course of more than sixty years of operation, a few stand out as all-time favorites – animal personalities so striking that they have gone down in history, so to speak. Patsy, the male California Sea Lion that lived for 19 years in the old building at the Battery, was one of them, and the 350-pound Giant Grouper that for years dominated one of the great indoor tanks was another. Making predictions of any sort is risky, but we believe we now have on exhibition one of those rare animals so outstanding and engaging that it is destined to become part of the tradition of our institution.

This is Olaf, our young Atlantic Walrus (*Odobenus rosmarus*) whose goodnatured charm and drollery have endeared him to public and press, tankman and curator alike. Experiences in various zoos, including our own, have shown that young walruses are practically always easy to get along with in captivity, but we find it hard to believe that they all could be as appealing as Olaf. From the day he arrived at the Aquarium in Coney Island he has been the center of attraction to an ever-widening circle of visitors, reporters, photographers and scientists eager to learn about a species so rarely seen alive outside its natural habitat.

Olaf is the only walrus in captivity in the New World, and, as far as we can determine, there are only three or four in European zoos: males in Hamburg, Munich and Moscow and perhaps a female in Copenhagen. Although he is considerably younger than any of these, Olaf seems t be the largest.

For us Olaf will always bear another distinc tion: in a sense, he was the first specimen we ob tained for the new Aquarium building. When h and his mate-to-be, Karen, arrived on October 9 1956, workmen were still busy with the unfin ished building and grounds. A temporary hom for the newcomers was found in one of the un fenced garden pools. Here they lived contentedl for two or three weeks during which time w believed we had gotten to know them and thei requirements pretty well. There were, howeve some surprises in store for us.

During this period, the garden pool was sup plied with running fresh water, since the pipe line which was to carry its sea water had yet t be installed. This did not worry us, howeve because we knew that walruses, like seals an sea lions, had been kept for years in enclosure provided only with fresh water – even though i nature they may spend much of their time at sea Nevertheless, when the salt water line was com pleted, we lost no time making the pool a se water one. It was then that Olaf and Karen lef the pool and began to explore their surrounding Since the whole area was bounded by a heav chain wire fence and there was nothing harmfu that the young wanderers could get into, we a lowed them to go where they pleased. In ou experience, all captive marine mammals like t take a look at their surroundings and, after a fe unhampered exploratory trips, finally settle dow in peace. Not so our two walrus babies. The

Popping up from the depths of his pool, Ola at his audience and then sinks quietly out o to continue his exploration. If any underwa ture can be worked loose, Olaf is sure to k

This still unfinished pool in the lawn of the Aquarium was filled with fresh water when the two baby walruses arrived in 1956. Unknown to us, they preferred fresh instead of salt water.

eventually settled down, but in another pool located at the other end of the area. This penguin pool-to-be was not quite finished and it, too, lacked its supply of sea water. We allowed the walruses to stay in the place of their choice — one temporary home was as good as another — but it was not long before the pipe that was to carry sea water for the penguins was put in, and once again the two walruses began to roam. This time they made a nuisance of themselves, getting in the way of the carpenters, plumbers, electricians and others who were hard at work in all parts of the building and grounds. At this point we decided, for the sake of their own safety as well as the maintenance of our construction schedules, that Olaf and Karen should be placed in the large Oceanic Tank which was to be their permanent home, even though it was still several steps from being completed. After the seawater pumping system had been arranged so that the deep tank would fill just enough for easy swimming, the animals were introduced to their new quarters.

In a few days we noticed that the appetite of both Olaf and Karen was falling off, but we put this down to their reaction to being confined. They ate less and less, and we could not imagine what was the matter. All of the foods they had so avidly eaten now interested them not at all. One day as we worriedly watched them, a few drops of rain started to drip into the pool from some new construction on the roof, and while we watched, both walruses pushed and jostled each other to catch the drops in their mouths. It was obvious that fresh water was what they wanted. When a garden hose of flowing tap water was lowered into the tank, the two youngsters gulped and gulped as if they would never stop. From then on we saw to it that our walruses were never without a supply of fresh water.

Although Olaf continued to take drinks of fresh water for several months, none of the other marine mammals that shared the Oceanic Tank with him ever availed themselves of the small

low of tap water we had piped into it. Young valruses may be unique among the seals and sea ions in their need for fresh water, although we ave seen baby Gray and Harp Seals eat ice with pparent relish.

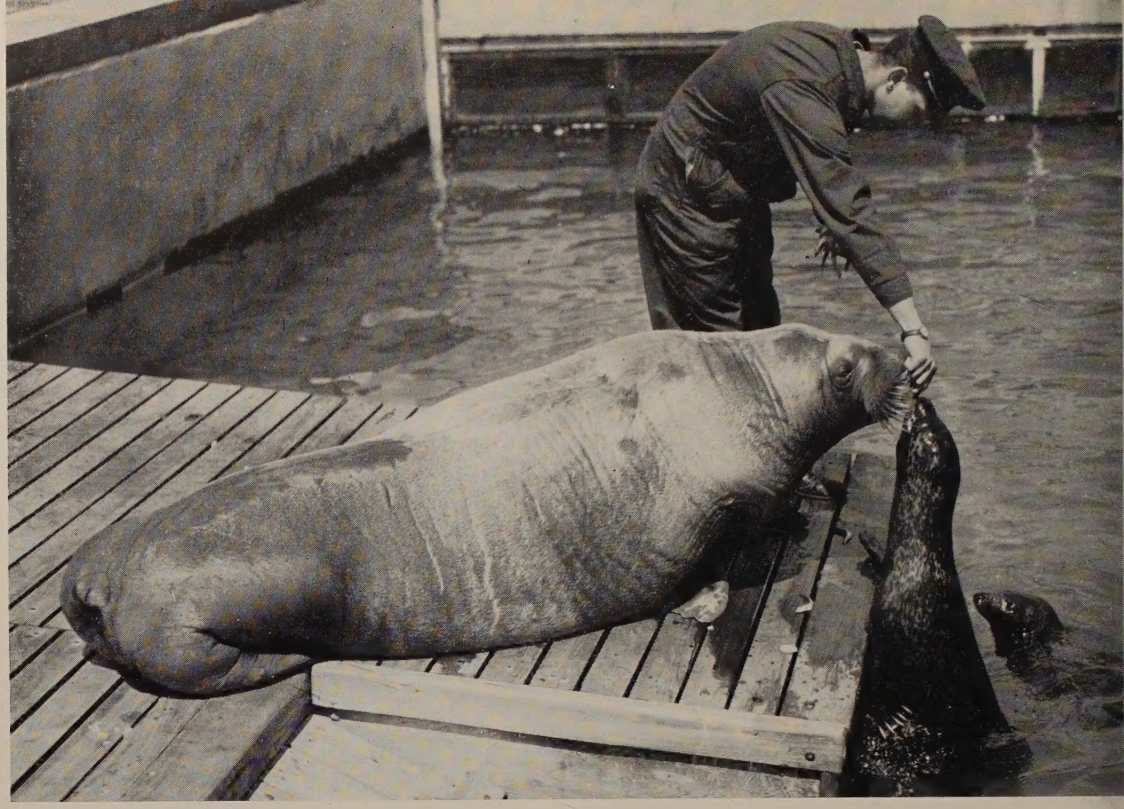
That young walruses need fresh water is only ne of the things Olaf has taught us. By watching him swim from both above and below the vater surface – as is possible in our Oceanic Tank – we have learned a good deal about walus locomotion. Zoologists consider the two spe-ies of walrus to be more closely related to the eals than to the sea lions and fur seals, and the vay that they swim confirms this relationship. Sea lions use their large, powerful foreflippers to ropel themselves through the water, their hind lippers acting only as rudders. Seals, on the other and, use the rear part of their bodies, together vith the hind flippers, as the principal means of ocomotion. The flippers are held vertically and wung back and forth in a manner reminiscent f the tail of a fish. Walruses, too, depend on heir hind flippers to push them through the vater, but instead of moving them from side to ide more or less together as do the seals, each lipper is moved alternately and the motion in-ludes a feathering-like rotary component that ndoubtedly adds to its efficiency. The front lippers are used in stopping, turning, rotating nd especially diving. Walruses appear to use hem more effectively than do seals, but this nay be an illusion caused by the much greater ize of the walrus. Seals and walruses both also pend a surprisingly large part of their time in he water swimming on their backs.

We recently got out our stopwatch and timed Olaf as he cruised about the Oceanic Tank. It egularly took him 15 seconds to swim from one orner to another, a distance of 70 feet. This igures out to be about three miles per hour, and udging from the ease with which Olaf main-ains this speed, we are convinced he could do so ndefinitely. His seeming effortlessness, despite is enormous bulk, can only be appreciated by eeing his blimp-like body sail majestically by. You could almost call him graceful.

By no stretch of the imagination, however, ould Olaf's movements on land be considered raceful. When out of the water, he gets about y what can best be described as a combination of a caterpillar's crawl and an old man's shuffle. In this, too, he is seal-like, although he gets more help from his front flippers than do the smaller seals.

In defence of the slow progress that Olaf makes overland, it should be pointed out that he is no lightweight. At the present time he is nearly seven feet long, not including his hind flippers which add another twenty inches to his length. His greatest girth, which is at the shoulder, measures six and one-half feet, and this tapers down to fifty inches just in front of the hind flippers. We estimate his weight to be about one thousand pounds. When he arrived, twenty months ago, Olaf weighed 240 pounds, so that he has gained weight at a rate of approximately 38 pounds per month, a little better than a pound a day! Full grown male Atlantic Walruses weigh between two and three thousand pounds and may reach 15 feet in length. Presumably this tremendous size is attained by the time the animals become sexually mature, that is, at seven years of age. It is easy to see that Olaf, who is at the most no more than 26 months old and possibly was born just two years ago, is still a "growing boy," and that although his rate of increase will undoubtedly slow down, he has a good deal of growing to do before his growth curve levels off. Female walruses do not become as large as males, but we can only speculate how long Karen would have maintained the advantage of 110 pounds that she enjoyed over Olaf at the time of their arrival. Karen's sudden death in January of last year put a temporary end to our dreams of a breeding pair of walruses; however, we have plans afoot that may yet give us that unique distinction.

Size alone makes Olaf stand out from the crowd, but it is the wonderful combination of bulk and friendliness that gives him his special appeal. To see an animal his size nuzzle his keeper like a puppy or play with a ball in the water for all the world like a child is a delightful incongruity hard to equal anywhere. When workmen have to enter the Oceanic Tank for painting or repairs, Olaf is always something to be contended with, since his curiosity is boundless and he seems afraid of nothing. That is, nothing except elephant seals. Shortly before opening day last year, we added two Northern Elephant Seals, an adult cow and an adolescent



Olaf gets along amiably with the Harbor Sea California Sea Lions that share his big tank, was obviously intimidated by the Elephant previously exhibited there. They had to be rem

male, to our Oceanic Tank. Although somewhat cantankerous in disposition, the two did not seem openly aggressive. Yet their effect on Olaf was blighting, to say the least. He barely went near the water, remaining immobile on the raft, and in other ways showed his mortal fear of the newcomers. There was nothing to do but remove the two elephant seals. Later in the year we introduced an even smaller male of the same species into the Oceanic Tank with the same result. We should mention, however, that Olaf gets along splendidly with the Harbor Seals and California Sea Lions that have shared his tank since last June.

Not much is known about the life history of walruses. For instance, some authorities claim that the female gives birth to her calf or pup in the water, although, with one possible exception, all species of seals and sea lions have their pups on land. Recent studies by A. W. Mansfield and his associates of the Fisheries Research Board of Canada are beginning to fill in some of the gaps in our knowledge of the Atlantic species. The young are born in April, May or June. Since the period of gestation lasts a year, we may presume that mating also takes place in the spring. Females nurse their single calf for 18 months to two years — a longer period, it is asserted, than in any other mammal. Females therefore canno have young more than every other year, but the average breeding frequency is actually one cal every three years. Olaf and Karen were born nea the coast of Greenland in the spring of 195 and, of course, were still nursing babies when captured.

Undoubtedly the principal obstacle to the suc cessful maintenance of walruses in captivity ha been the lack of proper food, especially for the young. Not until a satisfactory substitute fo walrus milk was worked out did any zoo or aquar ium keep walruses for satisfactory lengths of time (The record for longevity in captivity is now 1 years, held by a female that lived in the Copen hagen zoo from 1937 to 1949). To the best o our knowledge no one has ever completely ana lyzed walrus's milk, although we received the information that it contains 45% butterfat in directly from the captors of Olaf and Karen Without doubt, walrus's milk is very similar t seal's milk, whose composition is well understood Seal's milk differs from cow's milk, as well as tha

f most other terrestrial mammals, in its extremely high fat content and its very low sugar ontent. To simulate this, ordinary canned evaprated milk is fortified with vegetable oil (roughly ne part in twelve) and cod liver oil (roughly ne part in forty-eight). To this is usually added aw fish, either cut-up or shredded. We have nodified this formula by adding both fish and lams, with more of the latter than the former. Ve have also provided a generous vitamin B_1 upplement to counteract the known anti-vitamin ctivity of some of these foods. Now that Olaf as reached weaning age, we have gradually cut lown on the amount of milk in his diet. He now ubsists almost entirely on clams of the large, ard-shelled species, *Spisula (Mactra) solidisima,* and on fish, principally smelt, mackerel and utter fish.

It is generally agreed that in nature walruses ive principally on shellfish such as mussels and lams. It is also generally agreed that they use heir tusks to dig these burrowing ivalves out of the sand or mud. But one look at Olaf's tusks, which re only an inch and a half long, hows that they could not be of much use in procuring food. Immature walruses like Olaf and dult females in which the tusks re sometimes lacking, obviously must be able to feed themselves without the benefit of a built-in lam rake. (In a full-grown male, hese two modified upper teeth may be 24 inches long, and they an be used with devastating effectiveness as defensive or offensive weapons).

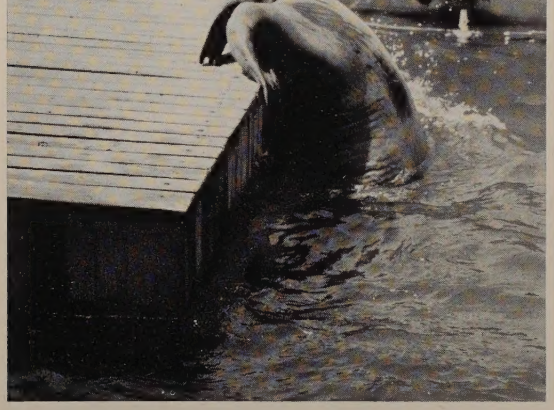
There is, however, no agreement as to how walruses handle their shellfish after they get them. The questions are: how do they get the animals out of their shells, and what do they do with the empty valves? Some biologists maintain that the shellfish are either swallowed whole and digested shell and all, or that they are crushed by the teeth and then swallowed. The shells may then be either regurgitated or digested by strong acid in the stomach. On the other hand, it has been reported that walruses with shells in their stomachs are seldom found, and this most likely indicates that shell and flesh are separated before the animal is swallowed. How this is accomplished, however, is a mystery. Since we have always fed our walruses on shucked clams, we can add nothing toward the solution of this problem.

We have observed, however, that walruses handle their whiskers with considerable manipulative skill. These tremendously thickened bristles must be more than mere hirsute adornment. We believe they play an important role in obtaining food under natural conditions. When given a fair-sized fish, Olaf holds it to the ground with his whiskers while he sucks off the flesh. If the

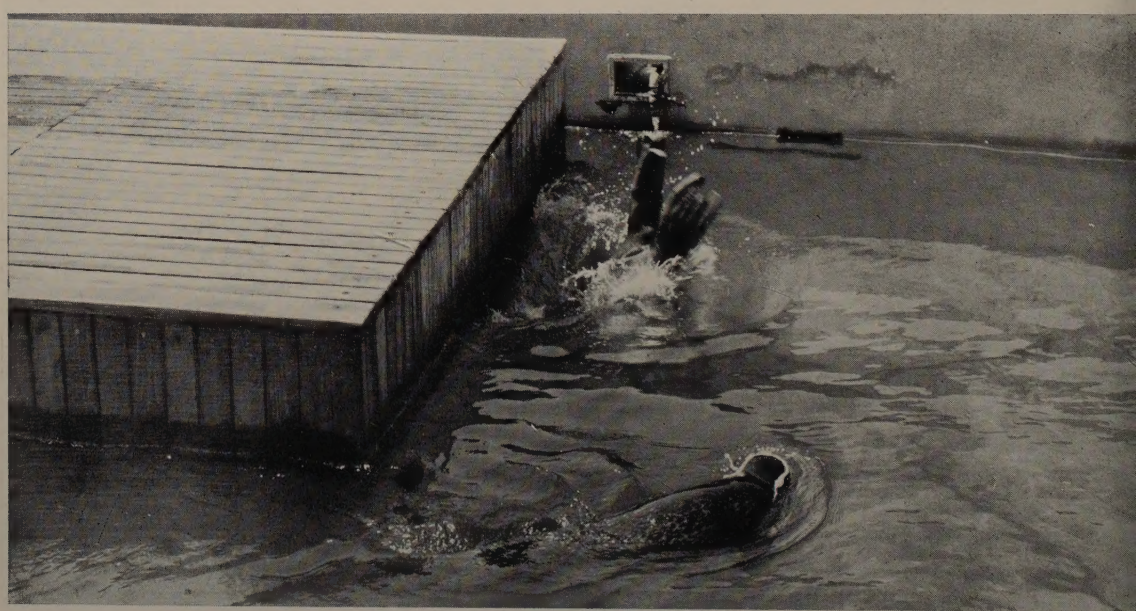
Olaf's tusks are only about 1½ inches long and are best seen as he is being fed. Here Tankman DiLauro offers a clam. Olaf is now two years old and is being weaned to an all-solid diet.

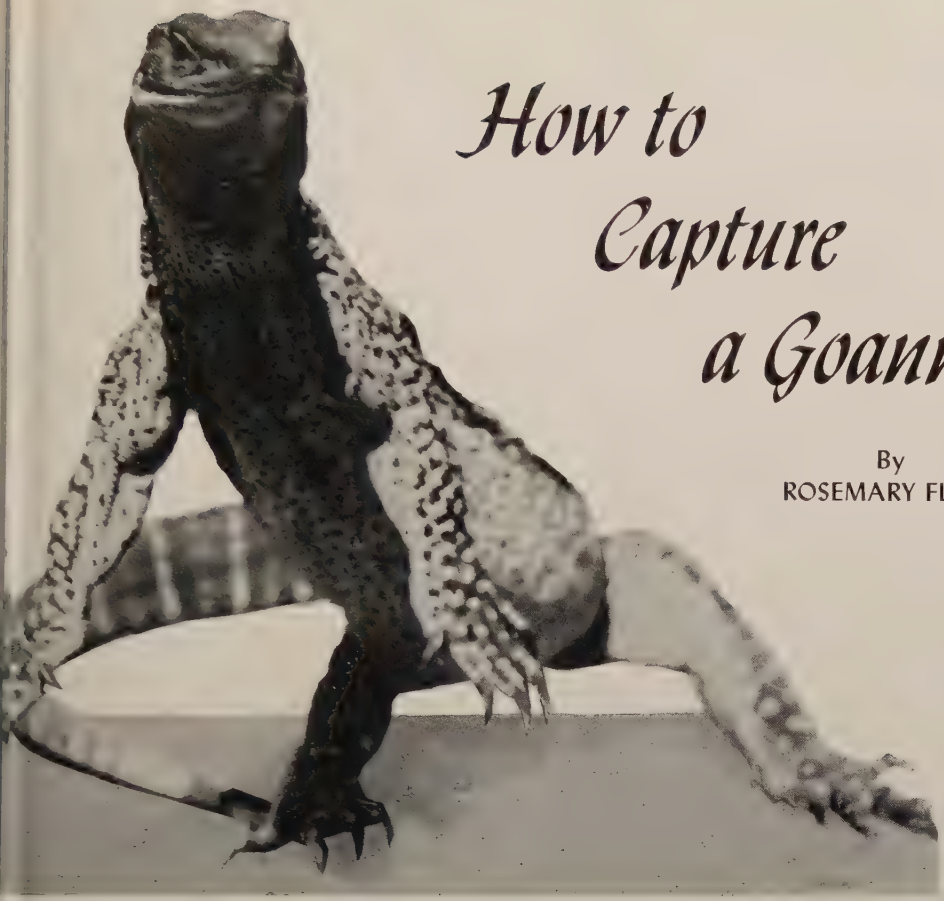
backbone is sturdy enough, a neatly skeletonized fish results. Olaf can also hold a shucked clam in the air with his whiskers before commencing to suck it into his mouth. We should point out that the peculiar arrangement of teeth in the walrus makes it impossible for the animal to use them in holding or biting food, although presumably it can crush or chew to some extent with its molars.

When an animal eats as regularly and as well as Olaf, any change in its feeding habits is immediately noticed. On the evening of Labor Day last year, Olaf refused to eat his supper. Thus began a self-imposed fast that lasted more than week. With the exception of a clam or two, h did not eat for the entire period. Nor would h come out of the water except on three or fou occasions. Instead he unceasingly swam bac and forth the length of the Oceanic Tank, seem ingly oblivious of the tankmen who care for him the visitors and the other animals in the en closure. We estimate that he swam at least 50 miles during this time — on an empty stomach Although no clear-cut migrations have ever beer described for the Atlantic Walrus, we shall b watching to see if Olaf repeats this performance



Olaf's keeper can usually summon him up o the float in the Oceanic Pool but when Ola wants to go back into the water there is n stopping him. For his bulk, he goes over board in a surprisingly unsplashing fashion





How to Capture a Goanna

By
ROSEMARY FLEAY

When a Goanna rears up like this, it means he is in a fighting mood and ready to take on all comers. A five-foot specimen, such as the one the author caught, can give a really bad bite.

Photograph by David Fleay

THE FLEAY FAMILY is notorious for collecting mammals, birds and reptiles while supposedly holidaying. It started a long time ago; when my father was a boy, he once spent his school vacation at an uncle's farm. Upon his return home my grandmother was shocked to find that his suitcase contained several lizards and a quantity of earth in which sundry tortoise eggs were hatching. His once neatly-pressed clothes followed by rail, crammed into a sack!

During the early spring of 1956 I spent an exciting vacation on Mr. and Mrs. Peter Bell's sheep property, "Dandaraga," in central Queensland. Before I left for "Dandaraga" my father jokingly told me not to return without a large Goanna for his collection. I didn't give it any serious thought, never having handled reptiles before — furred animals being more in my line.

What a surprise was in store for me!

The vast plains of central Queensland are covered by Mitchell grass and stunted growth known as Gidgee scrub, ideal habitat for the huge Red Kangaroos, Emus, reptiles and other wild life which abounds there. I made a casual enquiry and was told that several large Goannas had been sighted in the surrounding country that spring.

One warm morning when the men folk were away, Margaret Bell and I set out to muster a flock of some 700 sheep. I took the "tail" while Margaret and her dog kept the shoulder of the mob together. Things were going well and we were nearing home when my horse shied violently. I suddenly spotted the cause of the disturbance several yards away. It was a very large yellow and brown Sand Goanna. He was so busy digging at the base of a log above the entrance to a large burrow that he was not aware of my presence. I managed to calm the horse and,

without giving the sheep another thought, started wondering what to do about the Goanna. Here was my great chance! The reptile was more than five feet long, and broad and thick, and would certainly be a wonderful show in our Fauna Reserve.

My father's principle is action, when tackling an animal, so I didn't hesitate further but dismounted and with some trepidation made a rush at the Goanna. It was much faster than I was and after rolling out a great forked tongue toward me it shot into the burrow out of sight. I was grateful, really, for the only thing I had thought of doing was to grab its tail, and I would probably have been bitten had I managed to do that. It seemed common sense to plug the entrance to the hole with something. My pullover and several rocks were the only objects handy, but they would serve until I could find the departed Margaret and come back to dig him out.

Back on the horse I managed to round up the last straggling sheep. Margaret was waiting for me when I arrived home feeling guilty about my poor shepherding. However, she became quite excited when I told her about the Goanna, which I hoped was still plugged in its den and not scurrying blindly about the Gidgee scrub with my pullover over its eyes. We agreed to return to the spot as soon as we had yarded the sheep.

The return trip was made in the jeep, armed with crowbars, shovel, stout bags and rope, and it was a relief to find everything just as I had left it. We unplugged the hole and set about digging, hoping the reptile wouldn't come forth with a rush. Eventually, after some strenuous digging, our excitement mounted as muscular hind legs with their long sharp nails came into view. What a whopper he was!

We bound rope about his hind quarters to hold him should he suddenly back out and take off at a gallop. We didn't really have much idea what to do when we had him free of the burrow, but the best plan seemed to be for me to grip him by the tail and behind the head while Margaret held the bag open ready for his reception. Grasping the thick, scaly tail we pulled with all our might but he didn't budge an inch. So we dug still further. It finally appeared that his head and front legs were wedged firmly over a root. When, covered with perspiration and dirt, we finally removed the root we had to push our weight on the broad and muscular body and stand ready to secure a firm grip behind the head.

I managed to get a tight hold on the neck and

the tail and held on grimly. I had seen my father do this, and also had heard about the huge gash inflicted on the back of his hand by a large Tree Goanna. But it was too late to worry about that now, for it was all I could do to hold on when we dragged our Goanna free of the burrow. He twisted his body, blew out his throat and uttered bellowing hisses, with his huge jaws gaping widely and showing an imposing array of jagged teeth. After a great struggle we managed to push him head-first into the sack, and then gave him an extra shove and let go his neck at the same time. It was certainly a relief to tie that bag and Margaret and I shook hands and congratulated each other on our debut as animal collectors.

Back at the Bell's house we left the Goanna, bag and all, on the verandah and started making plans for his transport to West Burleigh.

Late that night I heard a scuffling noise on the verandah and rushed out to investigate. I had a

s are among the many kinds of food ed by Goannas. Here a large liz- attacking a venomous Black Snake, will be swallowed in a few gulps.

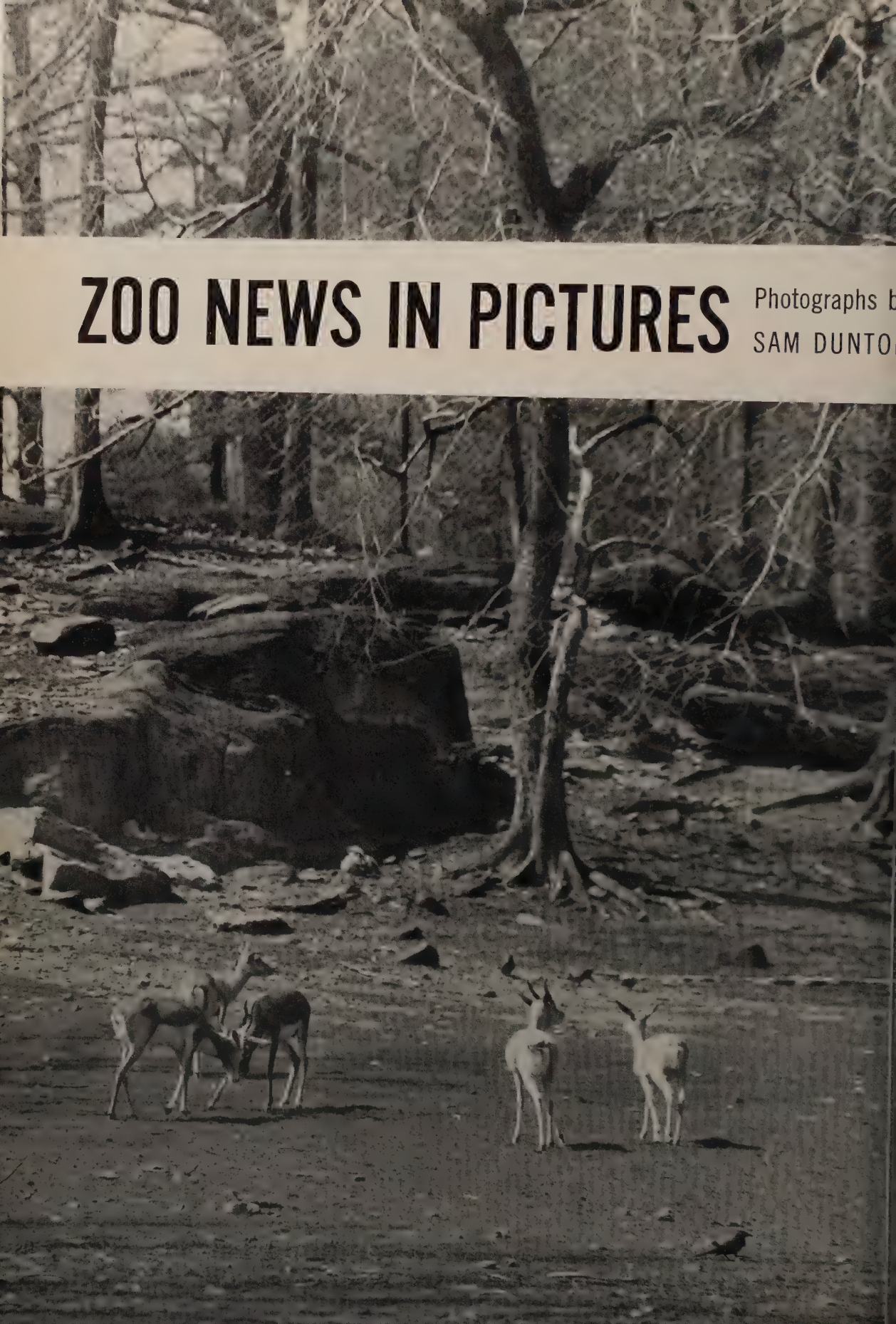
Both photographs by David Fleay

This is how you immobilize a Goanna if it has to be picked up — the trick is to seize the lizard before it has a chance to bite. This Goanna is "Dandaraga Dan."

suspicion about the knots we had tied — and, sure enough, I found an empty bag and no Goanna. However, luck was still with us for he wasn't far away and was just wandering aimlessly in the dark. He had apparently forced his way through the top of the bag. It was more than a relief to find he had not vanished into the night, for he probably would have returned during the hot days to feast on the products of the Bells' fowl pen.

Soon after I arrived he began to walk up and down the verandah with that peculiar, almost mechanical, motion of all large Goannas. Luckily it was possible to herd him into a bedroom and slam the door shut. I then called for assistance and Mrs. Bell and Margaret came to the rescue. We had an exciting time recapturing that big reptile. He reared up on his hind legs, presenting a fearsome sight as he uttered terrific hissing sounds, ready to take on all comers. From a safe position on a bed Mrs. Bell cleverly slipped a strong noose around his neck and held on. He scrabbled under a chest of drawers with Mrs. Bell in tow, and it took all our combined strength to drag him out and grab him behind the head again. Once more we forced him into the bag and tied it — securely this time. We then enclosed the whole thing in a stout box and the next day loaded him on the first train south. I felt quite proud of holding up the family tradition.

Today "Dandaraga Dan" as we call him is the king of the "Goanna Run" here at West Burleigh. He is constantly on the lookout for a tasty meal of eggs, meat or large eels. Perhaps he sometimes longs for his far-off home in the Gidgee scrub, but I doubt it, for he leads an idyllic existence, lazing in the sun, eating well and living in another self-dug burrow. Above all he is secure from rifles and guns and I really think when he winks those little eyes he is telling me I didn't do so badly by him after all. Goannas do a lot of good by killing and eating venomous snakes and although they look dangerous, they are not such bad fellows after all.



ZOO NEWS IN PICTURES

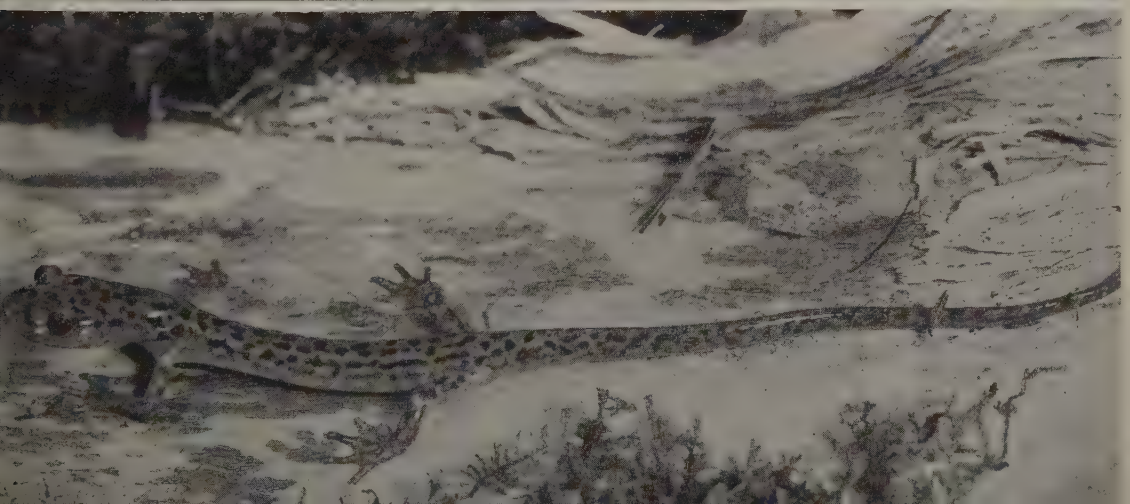
Photographs b
SAM DUNTO

Springtime

Down in the southwest corner of the Zoological Park, where visitors who arrive at the Crotona Gate see it first, is one of the prettiest springtime sights of the Bronx Zoo – a heard of 10 **BLACKBUCK** originally from the plains of India. Blackbuck are by no means uncommon in zoological parks, but few herds have such an open, wild setting as ours. The herd was established in 1941 and all its present members were born in the Zoological Park. Springtime always sees a good deal of mock fighting between the herd buck and a young buck not yet old enough to seriously challenge his elder. *Above:* Although we have had a sizeable flock of **AMERICAN** and **CHILEAN FLAMINGOES** for many years, they have never nested with us. This spring we built a tiny island in the Flamingo Pond and on the first mild day Curator Conway and Headkeeper of Birds Bell rolled up their sleeves and made an enticing series of mud nests on the island. At least, the nests looked enticing to *them.* Recently the Flamingoes have shown interest in the nests.

To be really lifelike, this photograph should be wired for sound so the coaxing whines of these baby **GRAY** and **HARP SEALS** could be heard – for they "talk" almost incessantly when they are hungry. No one has yet discovered a time when they are *not* willing to eat. Here Tankman DiLauro is offering a fish to one of the two baby Grays, while little Harps approach for a handout. The seals are exhibited in outdoor pools at the Aquarium. Two Harps came to us from C. W. Andrews of the Memorial University of Newfoundland, and 4 Harps and 2 Grays from Paul Montreuil and the Marine Biological Laboratory in the Magdalen Islands of Quebec. All are thriving and they are growing fast.

Three especially interesting new exhibits in the Reptile House are pic
the right. At the top is a **DWARF CAIMAN** (*Paleosuchus palpebrosus*
upper Amazon valley, the first we have exhibited. It was sent to us by
Medem of the Instituto de Ciencias Naturales of Bogota. *Center:* The s
myth is ancient and hardy – the idea of huge snakes living in the depth
sea. Nobody has ever captured one of those mythical monsters, but
snakes *do* exist and this spring we obtained one. It is the **COMMON B**
SEA SNAKE (*Laticauda colubrina*) of the Indo-Australian region, a ha
5-foot specimen, and was presented to us by Dr. Theodore H. Reed,
of the National Zoological Park. To date it has not fed voluntarily and
force-fed on smelts. *Below:* Although it is called the **CAVE SALAM**
(*Eurycea lucifuga*) and is usually found in the twilight zone of cave
highlands of the central United States, this strongly-marked, black-an
amphibian occasionally is found outside under rocks and damp wood. C
picked up in a cave in eastern Tennessee by Howard Sloane. It has

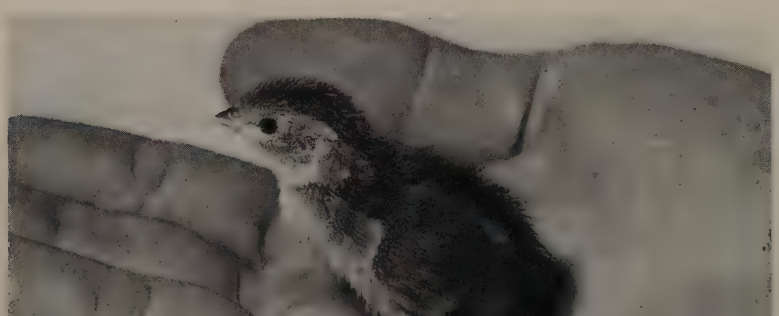


DESERT POCKET MOUSE
Perognathus penicillatus penicillatus

PACK RAT
Neotoma albigula albigula

BAILEY POCKET MOUSE
Perognathus baileyi baileyi

Really small mammals such as mice and wood rats seldom make spectacular exhibits, because their habits are largely nocturnal and by choice they sleep during the day. A few, however, are willing to stir about in the hours when visitors are in the Zoological Park, and we have just put some of these on exhibition in the Small Mammal House — the ones pictured above and to the left. Most interesting to easterners is the Pack Rat (or Wood Rat) which figures in so many tales of the West because of its habit of carrying away small objects to decorate its nest. Some of the Pack Rats are called "Trade Rats" because they often leave a pebble or other worthless thing as an "exchange." A single baby was born to our Pack Rats in May.



Last fall we obtained a pair of **HARLEQUIN QUAILS**, an East A species, and were delighted this when the female began laying eggs, small and white, were dropped on the sandy floor of partment in the Bird House. cubated them, and 19 hatched. just in time, for the female d April 25. This chick is 3 da

COUES GRASSHOPPER MOUSE
Onychomys torridus torridus

BANNER-TAILED KANGAROO RAT
Dipodomys spectabilis spectabilis

This, too, is a springtime picture, for the photographer brought back word that the **LION** at the left, while apparently roaring his defiance of the world, was really expressing his feelings in quite another way — by a very big yawn. These inhabitants of our African Plains exhibit are now about nine years old and they have settled into a middle-aged calm that only becomes more pronounced in warm spring weather. Consequently, they are being advertised for sale to other zoos and we are seeking five 6-months-old male cubs to enliven the exhibit.

The Nene Can Be Saved

By DILLON RIPLEY

Associate Professor of Zoology, Yale University

On July 29, 1955, there was an excited telephone call between Dave Woodside, Wildlife Biologist of the Hawaiian Territorial Division of Fish and Game in Hilo, Hawaii, and his boss, Vernon Brock, Director of the Division, at his office in Honolulu. Woodside had just spent seventeen hours observing a flock of more than twenty Hawaiian Geese, the first such flock of more than just a very few birds to have been seen by human eyes in eighteen years! Woodside reported that the birds were rather tame, that they were feeding on rattail grass seeds, and that the area seemed to be a definite feeding ground.

That was the start of an intensive campaign to save the Nene, the Hawaiian Goose, rarest species of waterfowl in the world. The Nene is the only goose in the world which has evolved as a distinct species, markedly different from any other known kind of goose, on a tropical island. It is a small bird, half the size of our common Canada Goose.

Above: ***Posed on an overlook position an a dead branch, a Nene gander stands guard; there is a nest in the vicinity.*** **Right:** ***As fog rolls over the bleak lava field in the distance, a Nene gander leaves its nest and flies away, calling to distract the attention of the photographer. The foreground shows a "kipuka" in the region of lava flows — a patch of grass and low trees.***

In color it is not too unlike the common Canada although the pattern is different. The Nene ha a black head and back of the neck but the rest o the neck is light buff-colored, the breast an flanks a soft grayish-brown, mottled on the flanks and the back a dark umber brown, the tail an wings blackish. But what sets this goose apart i the long black legs, longer than in other species The Nene is a landlubber, rarely going into th water on its home range, and the feet as a coro lary to this have very much reduced webs be tween the toes.

The Hawaiian Goose occurs only in the Hawaiian Islands and, in addition, it has a highly restricted range within the group. This has apparently always been so. Even in the early days of foreign exploration of the Islands, the Nene had a limited habitat, being reported only from certain parts of the main Island of Hawaii, with few records for near-by Maui, Kauai and little Niihau. There are no records for Oahu, the Island of the capital city, Honolulu.

Where Woodside watched his wonderful flock of Nene, and where I have walked over the Saddle Road as it is called, the slope between Mauna Loa and Mauna Kea at 6,000 feet above sea level, the tropical air of Hawaii blows chill. Usually there is fog, or the thick gray clouds rolling round the upper shoulders of the great volcanic peaks set down scattered bursts of cold rain. The country of the lava flows is barren and bleak. Recent

These kipuka meadows, scattered here and there in the wilderness of fog, lava flows and heavy tangles of forest, are the last home of the Nene. Here it is making a stand for survival, helped finally by man.

The trouble with the Nene in the old days was that the species was naturally tame. The birds became very friendly as captives. Young birds reared by the Hawaiians would tame up like pet dogs, following their owners around devotedly. One early explorer stated that Nene were much less suspicious than mainland species of geese, not rising high when disturbed but flying off near the surface of the ground.

With the advent of the foreigner the Nene was in serious trouble. Hunting of the bird by the Polynesian inhabitants had occurred prior to white settlement, and stories are told of the rounding-up of Nene during the season when

fields, up to sixty or more years old, are just bare expanses of cracked and broken black lava, to cut the shoes and numb the imagination with their sere and other-world appearance.

The older lava flows, where the rock has disintegrated under the hammering of the rainy climate, support life. There is a whole succession of stages, from the "kipuka," an island of meadow land covered with a variety of grasses and tender shrubs, to the occasional stands of stunted and dwarfed forest, heavy bushes, trees and tree ferns, ranked close together in a dank and dripping jungle.

they molt their long feathers, cannot fly, and can be herded like sheep. But systematic hunting with guns was much worse. The original hunting season for Hawaiian Geese was in our winter, in December, a time similar to the waterfowl hunting season in the United States. The Nene unfortunately breeds in December, but this fact was disregarded. Birds were shot as they were nesting, thus destroying the young or eggs as well as the adults. They were good to eat, too. In a book written eighty years ago, an English traveller with the delightful name of J. W. Boddam-Whetham, describing his stay at a vanished hotel

Above: ***A wild Nene's nest, with two eggs. When this photograph was taken by Wm. H. Elder, the goose had left the nest to feed.***

Right: ***This volcanic land is the Nene's sanctuary, bidding place. Old stone are almost the only land***

called the Volcano House on the slopes of Mount Kilauea, says that among other "luxuries" he ate "strawberry-fed goose, which had been enveloped in leaves and baked in a hole in the earth." The "strawberries" refer to a native berry found growing on the kipukas at 5,000-feet altitude.

Other enemies arrived as well. The mongoose, an indefatigable hunter, was introduced in 1883 to kill rats and soon turned to the more tempting game of birds and their eggs. Wild pigs became a problem. Originally a domestic breed, these animals now run wild on Hawaii and the other islands, and are common on the high slopes of the great mountains. Pigs would undoubtedly munch goose eggs with pleasure should they come on a sitting bird while foraging. Dogs have become wild on the upper slopes of Mauna Kea and Mauna Loa although they are not numerous, and presumably prefer to run domestic stock such as sheep and goats. Finally, diseases of birds were introduced along with some of the many thousands of North American and European game birds and small colorful birds introduced by various organizations of new settlers, pining for the familiar birds of their home lands. Under this onslaught, many of the native bird species retreated to the highest hills and stole away into a state of extinction. The Nene nearly departed this life along with the smaller species, the colo ful, Hawaiian-named "Mamo," the "Kioea," th "OO" and the "Moho." By the time George C Munro's book on Hawaiian birds was publishe during World War II, he was able to report tha Nene had been placed under protection and n shooting was allowed.

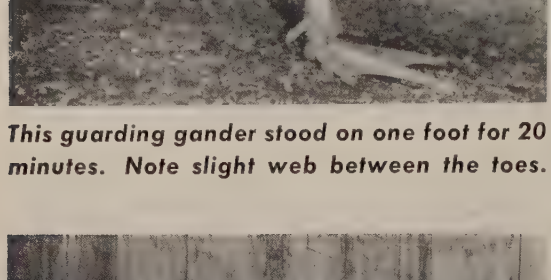
This was a step in the right direction. For th situation was now desperate. Where a populatio of at least "thousands" of this goose had been r ported in the previous century, a recent censu of 1951 reported ten birds seen on Hawaii an three birds in the island of Molokai. It wa thought at the time that the Molokai group wer stragglers from Hawaii, and perhaps represente part of the flock of ten. General estimates a through the years since World War II hav ranged from twenty-five to thirty birds in th

ild state, although no observer actually saw nore than ten.

In the meantime attempts had been made to eep the Hawaiian Goose in captivity. The first air of birds had been imported into England in 823. For many years after that the Nene lived nd was bred in captivity in England, and later n Holland and France. For lack of proper coordination and management, however, the stock windled, and finally died out in the interval etween the two World Wars. Efforts in Hawaii were nearly as unsuccessful. A few ranchers had ept Nene on their farm ponds in the 'nineties, ut rats managed to account for most of the oung that were hatched from the captive birds' ggs. In 1939, when I first visited the Honolulu oo, I saw three Nene that had been reared in aptivity by the Fish and Game Division of the erritory. These birds had come from stock kept ver the years by the one man who has done nore than any other to keep the light of hope burning for the Nene, Herbert C. Shipman of Hawaii. Mr. Shipman has kept a small stock of captive Nene going on his two farms near Hilo for many years, in spite of the onslaughts of rats, disease, volcanic eruptions, tidal waves and assorted acts of God. His birds have been the only ones which have persisted, and they have served as a reservoir on which to pin the future hopes of the species.

By 1949 the Government of Hawaii decided to take an active interest in a Nene-rearing program. This decision was prompted by wildlife surveys by U. S. experts, such as Dr. Charles Schwarz and Dr. Paul Baldwin, as well as the exhortations of numerous conservationists. A former CCC camp, high up on the slope of Mauna Kea near the Saddle Road at 6,000 feet, was chosen to house the project. The camp at Pohakuloa was thought to be suitable because it was in natural Nene teritory. Pens were built and six birds were rounded up at first, four from Mr. Shipman

This guarding gander stood on one foot for 20 minutes. Note slight web between the toes.



Eggs must be turned during incubation and here a captive goose is using her beak to turn one.

Unwilling to leave her nest, an incubating female drinks drops of rain collected on her back.

and two, including one wild-caught female, from the Honolulu Zoo. A young technician, Donald Smith, was put in charge. The first season in 1949 was a disappointment and no birds were reared although one of Mr. Shipman's pairs nested. During the second season, aid from overseas arrived in the person of John Yealland, a quiet, efficient rearer of ducks and geese from England, who was in charge of the waterfowl raising program at Peter Scott's Wildlife Trust. Peter Scott, one of the most remarkable figures of his generation, who combines the talents of artist, waterfowl expert, lecturer, small boat skipper, pilot and television idol, had started his Wildfowl organization after World War II in order to focus public interest on the plight of waterfowl in general, and to serve as a clearing house, at least in Western Europe, on all sorts of information and research about ducks, geese and swans. Yealland's experience was just what the Pohakuloa project needed. That season two young were successfully reared.

Mr. Shipman, persuaded of the usefulness of spreading his treasures, sent a pair of his geese back to England with Yealland on his return. The Wildfowl Trust, well-equipped by experience to handle rare geese and to breed them in captivity, was the obvious place to undertake some intensive rearing. But fate intervened. In March, 1951, both Nene proceeded to sit down and make nests. Male and female Nene look alike, and even the experts can be fooled. A hurry-call cable to Hawaii from England resulted in the fastest transport of a Hawaiian Goose on record. In exactly seven days from the arrival of the two sets of goose eggs, a live gander was flown in from the Government project at Pohakuloa. But it was too late for that season. The Hawaiian Nene breeding season was already over. Nene nest in Hawaii in December and January. In our temperate climate nesting comes later, in very late February or March. The geese greeted the gander with enthusiasm, according to Peter Scott's report, but the gander did not respond.

But 1952 was a banner year for the Wildfowl Trust. In that year nine young were successfully reared from the two geese, with both of whom the gander, appropriately named Kamehameha after one of the greatest of the Hawaiian Kings, had mated. The flock was off to a flying start

This photograph of a guarding wild gander was taken on hatching day just as he turned at the summons of the nesting goose's call.

At the Pohakuloa Nene Restoration Project in Hawaii, two banded adult geese parade with their young, two six-weeks-old goslings.

Since then there has been nothing but success to report. A few losses and accidents have been more than made up for by the added numbers reared each year. In the autumn of 1957, there were fifty-two Nene in Europe, a striking increase from the original of six years before.

MEANWHILE, there was that exciting telephone call in 1955 in Hawaii. The sighting of a flock of wild Nene, after so many years, lent real impetus to planning for the future. If Nene could somehow survive in the wild state, then there was more than ever a real point to the captive program. Not only would captive rearing insure that this unique species would continue to exist, but there was a hope that some way might be found of aiding the wild population. Obviously, if a survey could be made of the wild flock, if some of the questions that intrigued biologists could be answered, there might still be hope for a wild population of Nene.

Was disease, the mongoose, or wild pigs responsible for keeping down their numbers? Was the restricted range of the geese a factor? Sugar plantations have taken over where Nene used to roam at lower elevations. Were there seasonal food or water shortages on the high mountain slopes? Much of this could be answered if a full time survey could be made. Putting their heads together, the Hawaii Territorial Board of Agriculture and Forestry, the Bishop Museum, Yale University and the International Committee for Bird Preservation found a candidate in Prof. William Elder, a lean, soft-spoken Missourian who had done important work on the native Canada Goose of North America.

Funds were secured, including a Guggenheim Fellowship, and Dr. Elder arranged a year's leave from the University of Missouri. Already his research has produced much interesting and valuable data about the life cycle of wild Nene, the stages of feather molt which leave the adults

Right: ***Peter Scott of the Wil Trust in England, with some o Hawaiian Geese reared there. lustrates the tameness of the***

Below: ***There are ideal facilities in these rearing pens at the Pohakuloa project in Hawaii — pools and clover turf, a protective covering screen.***

helpless for a time after the breeding season, and the development of feathering in the young. Last December, Elder and Woodside discovered nests of wild Nene, four of them, exactly where old-timers reported that the wild flocks used to nest half a century ago. Waterfowl are very conservative creatures. They are greatly ruled by tradition. And so the remaining Nene, at least twenty-eight of them, still cling to the tiny, windswept patches of grassland amid the raw lava flows as had their ancestors, high on the mist-shrouded slopes of Mauna Loa.

And there has been more progress. The good efforts of the unofficial Nene Committee, spearheaded by the energetic Director of the Honolulu Zoo, Paul Breese, have resulted in the Nene being made the Official Bird of Hawaii as of May 7, 1957, by action of the Hawaiian Legislature. Negotiations are under way with prominent ranch-owners and estate trustees on Hawaii to attempt to set aside the land where the Nene are now known to nest as an inviolate refuge, safe from hunting and from the attacks of predators. If a Nene park can be set up, with one stout wire-enclosed pen to keep out predators, it is hoped to experiment with a gradual introduction of captive-reared birds back into the wild flock. This will be the acid test for aviculture. If a species can be saved in this way, it may mark a new understanding of practical conservation techniques.

If we who are interested in wildlife and its future can do something to preserve threatened species, tiding them over bad times and the buffeting of a changing environment, it may be the beginning of a new trend toward saving other threatened and vanishing species. It is seldom indeed that man, the perennially restless changer of his surroundings, has a chance to make such positive efforts to save an otherwise doomed species. Now, after a few years' hard work, with a population of approximately one hundred Nene in captivity, and at least twenty-eight wild birds — now, at last, the Nene is coming back.

In the Small Mammal House Now:

TWO RARE INSECTIVORES

By WILLIAM BRIDGES

TWENTY-ODD YEARS AGO when this magazine last published an extended account of the Hispaniolan (or Haitian) Solenodon, the Director of the National Zoological Park contributed the comment that "in 1910 when exhibiting the solenodons, we had at the same time a tenrec in the collection."

The Bronx Zoo, too, had had Solenodons in its collection in 1910, and was properly envious of Washington's good fortune in being able to show both of these rare and curious and distantly related insectivores. Now, at last, we can do it. We have a Hispaniolan Solenodon (*Solenodon paradoxus*) and a Tenrec (*Tenrec ecaudatus*) on exhibition in the Small Mammal House. That they sleep most of the day and are seldom more than partly visible makes no difference — they *do*, when they feel like it, stir and move about in the daylight hours, and they *are* authentic rarities.

The Hispaniolan Solenodon was described scientifically in 1833 but knowledge of it was almost a blank until 1907 when three specimens were captured for the American Museum of Natural History. Several living Solenodons came out of Haiti and San Domingo in 1910 and we received three.

One died within a week and the others not

TENREC
Tenrec ecaudatus

HISPANIOLAN SOLENODON
Solenodon paradoxus

long afterward. At long intervals we have had a few more — in 1935, 1949, and now one that came on April 12 of this year and seems to be in excellent health and spirits.

There is another Solenodon, the Cuban, but it has not been seen for many years and is probably extinct. For that matter, the little animal still found in Haiti and San Domingo may not be long for this world, on account of mongooses, cats and dogs.

Although it has been known for so long, not much is accurately known about the Solenodon's life in the wild. It is an insect-eater, but does not disdain small snakes and tiny burrowing mammals. With us it thrives on an improbable but nevertheless well-rounded diet of watered-down evaporated milk, chopped horsemeat, codliver oil, bone meal and the yolk of an egg.

Just how closely related are the Solenodon of the West Indies and the Tenrec of Madagascar is a debated point; each is in a separate family, and they are certainly far removed in space and time. Both are insectivores. Both are rare in zoological collections. We have, indeed, had but four Tenrecs in earlier years, the last in 1914. This is the more surprising because Tenrecs appear to be plentiful in Madagascar — the only place in the world where they are found. Our present species is said to have 15 to 21 young at a birth. It goes to sleep underground from June to December and the natives dig it out for food.

News from the Conservation Foundation

Pesticides and Forest Spraying

Chemicals such as DDT are being used more and more extensively in forest management, but many questions remain regarding their effect on fish and wildlife, on forest growth and regeneration, and even their long-range effect on insect pests. Through conversations with landowners in Maine, we have encouraged new research on some of these aspects of pesticide use. In June, 300,000 acres in Aroostook County will be sprayed against the spruce budworm. The Maine State agencies will observe spraying effects, especially on fish, and, owing to our interest, this research will include effects on the aquatic insects on which local fish feed. Over three years, Dr. G. M. Woodwell of the University of Maine will study the effects of DDT on seed germination and seedling growth – matters clearly vital to the economic future of the area.

Businessmen and Conservation

In late April a most successful conference was held at the University of Michigan on "Natural and Human Resources in Area Development." This conference, organized by Roger Hale, was attended by about 100 persons from many parts of the country – from universities, industrial corporations, utilities, and planning agencies. Its purpose was to bring together people of a wide range of interests sensitive to American resource-use problems, especially those who are alert to aspects of space-use planning, the relationship between sound resource management and sound economics, and population trends.

Some of the topics discussed included "Training Needs for Land Planning," "Urban and Rural Relationships" and "The Impact of Industrialization on Low Income Farm Areas." The proceedings of the conference will shortly be published and distributed. More than four thousand copies will be sent out to business leaders, planners, economists and educational institutions interested in improving training programs for those who will be responsible for decisions in resource management in years to come.

Oil Drilling Operations

Roger Hale attended an informal conference called by Fred A. Seaton, Secretary of the Interior, on the conflicts that develop when wildlife and wilderness areas of the National Parks and other Federal lands are drilled for oil. Representatives of many major domestic oil companies and of several conservation organizations participated. While no definite policy resulted from the discussions, progress was made toward a better rapport between the oil companies and conservation groups. Similar meetings are planned for the future.

Pesticide Program Against Fire Ant

The fire ant is now a serious problem, causing extensive damage to croplands and to economic activities in at least eight Southern states. The Federal Government, in collaboration with State agencies, has already begun an intensive campaign against this pest. Several chemical pesticides, including the extremely toxic agent dieldrin, are being used. It is quite possible that this campaign may have highly injurious effects on many forms of animal life because present knowledge of the ecological consequences of such programs is still extremely inadequate. Dr. John L. George, author of an earlier study, *The Pesticide Problem,* sponsored by the Society and the Foundation, is making a field survey of the fire ant operations. He will attempt to evaluate the possible effects of the operations on wildlife populations, and also make specific recommendations for the research work that is clearly indicated if pest control programs are to be safe as well as effective.

The Trustees

Harold Dodds, President Emeritus of Princeton University, and David M. Heyman, President of the New York Foundation, have been elected members of the Board of Trustees.

BEHIND THE SCENES

NEWS AND NOTES OF THE ZOOLOGICAL PARK, THE AQUARIUM AND THE DEPARTMENT OF TROPICAL RESEARCH

Everything Is Ready for the Duck-billed Platypuses

As this issue of ANIMAL KINGDOM goes to ress, we are awaiting cabled word from David leay as to the date on which he expects to ar- ve in New York by air with two or possibly hree young Duck-billed Platypuses. Two we are ire of – Paul and Pamela. A second female, ptured in mid-May and named Patty, may or ay not be sufficiently air-minded to make the ip. Latest reports are hopeful however.

Everything is in readiness to receive them here, hether there are two or three. A hitch de- loped at one point when the U. S. Department Agriculture ruled that Australian soil, the abitat of earthworms Mr. Fleay must carry with im to feed the babies en route, could not be ermitted to enter Hawaii, one of the stopping laces of the plane. It was proposed that the rthworms be carried in damp sphagnum moss, t experiment showed that Paul and Pamela dis- ked sphagnum-bedded earthworms and would ot eat them. Subsequently the Department of griculture agreed that sterilized Australian soil ould be brought into Hawaii, where it would e confiscated and the worms transferred to erilized Hawaiian soil after they were rinsed.

The Platypusary in the center of the Zoologi- al Park has been repaired and repainted, the inter storage Platypusary in the basement of he Lion House has been reconditioned, and egular and copious food supplies have been ar- anged for – crayfish from Louisiana, frogs from New Jersey and and earthworms from Florida.

Mite that Killed Goldfish Named for Dr. Nigrelli

When a tankful of newly acquired Goldfish egan to die mysteriously in the spring of 1953, Dr. Nigrelli, the Aquarium's Pathologist, made a routine check and discovered that some small mites, slightly more than 1/100 of an inch long, were apparently killing the fish. These relatives of ticks and spiders are found all over the world, but none had ever been known to attack fish. Further investigation showed that a poison produced by the mites was causing the Goldfish's death. Water in which mites had lived quickly killed healthy Goldfish and Guppies, even after being carefully filtered to remove the tiny creatures, and the toxicity of the water could be correlated with the number of mites that had lived in it. The tank was immediately quarantined, and no further attack occurred until the following year, when mites briefly appeared again in the same aquarium. Since then we have had no more trouble with mites.

Histiostoma nigrellii

This was a unique experience; it was therefore important to find out exactly what species of mite was responsible. Dr. Nigrelli turned to Dr. Roscoe D. Hughes of the Medical College of Virginia, an acknowledged authority on the classification and biology of mites. What he found out made the incident seem even more remarkable. A different, but related, species was involved in each attack. The two mites belong to a large Family of mites usually found on decaying organic matter. No member had ever before been found living in water. One species had been described from Java and Sumatra in 1931. The other turned out to be new—a species previously unknown to science. Dr. Hughes and his collaborator, Dr. Caroline Goode Jackson, have described it in a recent issue of *The Virginia Journal of Science*. They have named it *Histiostoma nigrellii* in honor of Dr. Nigrelli.—J. W. A.

President Osborn, in the hall o the Administration Building a the Zoological Park, displays a Sulphur-crested Cockatoo t some of the Consuls Genera and their wives, of 24 countries who made a tour of the Zoo on May 15. At Dr. Osborn's right is Richard C. Patterson, Jr., Commissioner of Commerce and Public Events, who arranged tour

Children's Zoo Has Its 5,000,000th Visitor

During the first week of the Children's Zoo's eighteenth season, the 5,000,000th visitor passed under the bridge that spans the entrance. Whether the visitor was a child, and walked in upright, or an adult and had to stoop to go under the low bridge, we do not know. Attendance records indicated that the 5,000,000th visitor would enter about ten days later, but a combination of good weather and publicity attending the opening on April 5 was such that the Children's Zoo was swamped. Normally 10 to 12 per cent. of the Zoological Park's attendance on Sundays and holidays pays to enter the Children's Zoo; the figure is 20 per cent. on the three days each week when admission is charged to the Zoo. But during the three days of the Easter holiday, the Children's Zoo drew 30 per cent. of the total attendance. On opening day, it was the second highest in eighteen years.

Curator Conway Attending Meeting in Helsinki

Curator of Birds William G. Conway left at the end of May to attend the meetings of the International Ornithological Union and the International Committee for Bird Preservation in Helsinki, as the representative of the Zoological Society. Before his departure he was elected secretary of the American group attending the meetings.

He will visit several European zoological parks before returning near the end of June.

Staff Changes at the Zoological Park

Dr. James A. Oliver, Curator of Reptiles since September 1, 1951, assumed the additional duties of Assistant Director on May 15 following the resignation of Dr. Leonard J. Goss, Veterinarian and Assistant Director. Dr. Goss on May 15 became Director of the Cleveland Zoological Park.

At the same time Dr. Charles P. Gandal, Assistant Veterinarian, became Veterinarian.

Dr. Goss came to the Bronx Zoo on August 1 1939. He has taken on the directorship of one of the young and vigorous zoos of the mid-West with several excellent buildings, an interesting collection and a reputation for enthusiastic local support, and in his new job he has the best wishes of the staff of the Bronx Zoo and his many friends in the Zoological Society.

Antelope House Gets New Roof, First Since Opening in 1903

When a major reconstruction job has to be performed on an animal building — such as a new roof — it is highly desirable to remove the animals. Sometimes, however, this is impracticable, and that is largely so in the re-roofing of the Antelope House that began near the end of May. Built in 1903, the building has never been completely re-roofed and the time has come when it has to be done.

Antelopes and Giraffes, unfortunately, are easily frightened by unusual noises and activity and would certainly not take kindly to roofers working directly overhead. Consequently the job will be done in two stages and while each side

of the building is being worked on, its animals will be temporarily quartered in the African Plains antelope shelter.

IN BRIEF

No Cobra Eggs. For the past three years the female King Cobra in the reptile collection has laid a clutch of eggs on April 24. This year, no eggs.

Cancer Studies. The latest use to which the special strains of fishes from our Genetics Laboratory are being put is to test the theory that viruses are the cause of cancer. Dr. Helen V. Coates, D.V.M., of the Department of Pathobiology of the Johns Hopkins Medical School, is now starting a series of experiments on fishes specially bred for the purpose by Dr. Myron Gordon. It is hoped that these experiments will reveal whether a virus is in any way responsible for the hereditary pigmented tumors found in our hybrid fishes.

Art in the Tetons. Paul Bransom, the animal illustrator who maintained a studio in the Zoological Park in its early years, has established an outdoor art school at Jackson Hole, Wyoming. With him, under the name of "Teton Artists Associated," are Conrad Schwiering and Grant Hagan. Classes for amateur and professional artists are held three days a week during July and August.

PUBLICATIONS OF INTEREST

SNAKES IN FACT AND FICTION. By James A. Oliver. 199 pp., 20 photographs. The Macmillan Company, New York, 1958. $4.95.

Curators of Reptiles, by one definition, are people who spend their lives correcting the public's mis-information about reptiles – above all, snakes. The Bronx Zoo's Curator of Reptiles does the job in wholesale proportions in his new book. The list of chapter headings shows how much territory he covers: Mythical Monsters, Sea Snakes, and Fossils; Giant Snakes; More Giant Snakes; Prodigious Meals; Aggressive Snakes; Dangerous Snakes; Snake Charmers; Family Life; Snakes in Numbers; No Snakes in Ireland; Enemies – Real and Imaginary; and Memorable Moments, this latter being some lively accounts of "extraordinary occurrences" he and other herpetologists have lived through. Giant snakes are a subject that fascinates Dr. Oliver (as it does many laymen), and he devotes two chapters to a survey of the literature. His own conclusion is that Anacondas probably do, occasionally, attain a length of 37 feet and perhaps somewhat more. Throughout the book Dr. Oliver has quoted extensively from old and modern accounts of snakes, always setting the record straight when it is necessary to do so and not avoiding giving his own informed opinion. The result is a book that can be read with pleasure by anyone, and with profit by beginning and amateur herpetologists. – W. Br.

A PADDLING OF DUCKS. By Dillon Ripley. 256 pp., 34 illus. and jacket designs by Francis Lee Jaques. Harcourt, Brace and Company, New York, 1957. $6.

This is a thoroughly enjoyable book. Dillon Ripley, Curator of Vertebrate Zoology at the Peabody Museum and Associate Professor of Zoology at Yale University, tells in a delightful and literary fashion of his long association with waterfowl. By the time Dr. Ripley was seventeen he had constructed a small duck pond. From this beginning he takes the reader through twenty-five years of watching, breeding and searching for waterfowl in far-flung places. As the subjects arise, Ripley's narrative flows through sound discussions of his hatching, rearing and feeding procedures as well as informative historical notes of captive waterfowl, and waterfowl of the world in general. Especially interesting is his account of the Spedan-Lewis, Terry Jones waterfowl rearing techniques in England, and a wonderful tale of a visit to the famous Sir David Ezra in Calcutta. Thirty-four fine black and white illustrations by Francis Lee Jaques add greatly to the enjoyment of the book.

The increasing importance of aviculture in present-day ornithology and conservation is repeatedly delineated by Dr. Ripley. Those interested in natural history whose backyards are too small for duck ponds should read this book with caution! – W. G. Conway

ZOOGEOGRAPHY—THE GEOGRAPHICAL DISTRIBUTION OF ANIMALS. By Philip J. Darlington, Jr. Pp. xiv + 675, 80 figures. John Wiley & Sons, Inc., New York, 1957. $15.00.

The distribution of animal life on the earth is a subject of great fascination for the layman and scientist alike. Both are aware that particular species are found only in certain parts of the world and not in others. Thus, everyone knows that polar bears are found only in the Arctic, whereas penguins are characteristic of the Antarctic area and are absent from the northern cold regions. The scientist is interested in the details of distribution patterns and the reasons for them.

One scientist who has devoted a great deal of energy and time to these matters is Harvard University's Philip J. Darlington, Jr. Dr. Darlington is primarily an entomologist, but he has always been interested in the study of zoogeography. This book is the result of his studies in this field, and it is an excellent testimony of how well he has spent his time.

"Zoogeography" outlines the distribution patterns of the different groups of vertebrates, analyzes these patterns and endeavors to explain their origin. The author then reconstructs the past history of the vertebrates in relation to their evolution and distribution. Finally he evaluates the principles of zoogeography and reviews the geographical history of man. The serious student of natural history will find much of interest and enlightenment in this outstanding book. – J. A. O.

SEALS, SEA LIONS AND WALRUSES. By Victor B. Scheffer. Illus. 3 tables, 15 figures and 63 photographs and drawings in black and white. 179 pp. Stanford University Press, Stanford, Cal., 1958. $5.00.

The Seals are mammals of very special interest, not only for the beauty of the fur produced by some species

but for their great physical variation, ranging from the grace of the Sea Lion to the gargantuan bulk of the Elephant Seal. Although a voluminous literature has been built up over the years, the references are scattered and not for many years has a general review of the entire group appeared. Mr. Scheffer is especially well equipped for the task, through extended study and field work in the interests of the U.S. Fish and Wildlife Service. There is much technical material, of course, and there are controversial uses of nomenclature, since there is wide divergence between authorities on such matters. But this book will be welcomed by technical workers and there is enough general information to satisfy the layman. – L. S. CRANDALL

SPIDERS, SCORPIONS, CENTIPEDES AND MITES. By J. L. Cloudsley-Thompson. 228 pp., 17 black and white illus. and 39 figs. Pergamon Press, New York, 1958. $9.00.

There are a number of semi-popular books on insects and marine Arthropoda. Cloudsley-Thompson has written about the lesser known members of the phylum. Though the reader is required to have some zoological background, I know of no other book that presents the sow-bugs, millipeds, harvestmen, solfugids, ticks and other rather obscure orders of terrestrial arthropods in such readable form. Besides giving the usual classification and distribution of each group, he gives the all too frequently omitted information on food, enemies, behavior and life cycles. – H. S. FLEMING

New Members of the New York Zoological Society

(Between March 1 and April 30, 1958)

Life

Alexander Aldrich
William C. Beller
Otto Marx, Jr.
Joseph A. Thomas

Supporting

Miss Cornelia Van A. Chapin
Mrs. Benjamin Gilbert
Mrs. E. Roland Harriman
Mrs. Archer M. Huntington
Mrs. Albert Spalding
John T. Terry
Miss Alice Tully
Orme Wilson

Contributing

Arthur L. Barnett
Mrs. Walter C. Bent
Nicholas F. Brady
Mrs. R. Rionda Braga
Mrs. J. Ogden Bulkley
Robert C. Burtnett
Mrs. C. Reed Cary
Mrs. Hobart Cook
Gerry J. Dietz
G. Chester Doubleday
Mrs. Samuel Dunaif
George Edgar
Mrs. Shirley C. Fisk
Eliot Freidson
Mrs. John D. Gordan
Robert J. Hamershlag
Walter Hoving
Mrs. Howell Howard
Frank E. Karelsen
Mrs. Joseph M. Kirchheimer
W. Roy Manny
Alastair B. Martin
Lee McCanliss
Mrs. Margaret P. Mendell
Edmund Prentis
Henry Reynolds
Mrs. Hilda C. Rodman
Mrs. Frank B. Rowell
Frederick A. O. Schwarz
Michael Gordon Thompson
Joseph Walker
Charles J. Wallace
Admiral George M. Wauchope
Mrs. Frank A. Weil
Mrs. Robert Wise
William L. Wisner, Jr.

Annual

Mrs. Thomas P. Almy
Arthur W. Ambler
Edward H. Anderson
Jerry Armus
Miss Ann McD. Bannerman
C. Francis Beatty
Dr. Raymond T. Beldegreen
Dr. Morris H. Bernstein
Mrs. Edward H. R. Blitzer
Sidney Blum
Miss Rachel Helen Bones
Harry D. Boyce
Mrs. Arnold C. Brackman
Daniel A. Brener
Frank J. Brennan
Miss Mabel W. Brown
Harry I. Cobern
Frank P. Connor
Miss Patricia A. Cousins
Richard J. Crohn
Joseph E. Deems
Sam Deitchman
Miss Florence E. Donnelly
Miss Ethelwyn Doolittle
Miss F. Belle Figger
Mrs. E. C. K. Finch
Dr. Bernard D. Fine
Mrs. Morris R. Fischer
Andrew Fisher
Mrs. Michael Fitzmaurice
Miss Doris Foster
J. W. Fredericks
Mrs. Sylvia M. Friedlander
Mordecai L. Gabriel
Gordon S. Gavan
Mrs. Robert Gordon
Dr. Jean M. Gould
Bernard F. Greene
Price B. Hall, Jr.
Robert Halsband
Dr. Victor Herbert
Mrs. Alexandrina MacG. Hersey
Edward S. Hodgson
Seymour Katz
James C. Kennedy
Mrs. Daniel Klein
Daniel B. Knock
Richard Kool
Allan Kramer
Frank Kramer, Jr.
E. H. Kuehn
Dr. Ben Marr Lanman
Mrs. Burton Lasky
Mrs. Edmundo Lassalle
Miss Paige Mallory
B. L. Mazel
Mrs. Roberta McCormick
William Mezzabarba
Mrs. Joseph F. G. Miller
Eli C. Minkoff
Joseph Mintzer
Miss Anna N. Nelson
Andrew E. Norman
Mrs. Dorothy S. Norman
Innis O'Rourke, Jr.
Mrs. Selig Paskin
Mrs. Ray Patelski
Mrs. Howard Phipps, Jr.
Theodore M. Pomeroy
Dr. Frank Ratner
Stephen Rosenbaum
Mrs. Jesse Roth, Jr.
Milton Schwartz
Mrs. Howard P. Serrell
Murray H. Shulman
Mrs. Ruth Simmonds
Mrs. Lawrence Squires
Albert H. Tomlinson
Master Harold M. Tovell
William J. Tully
Mrs. Harold Valk
Miss Florence E. Walsh
Miss Alice W. Wardwell
Frank A. Weil
I. Weintraub
Mrs. Josephine Wendling
Ross F. Williams
Dr. Julius Wolf
Col. Waldo W. Zagat

We're Whooping It Up in the Zoo

Going away for the summer? Send us a postcard with your summer address (and the date of your return to your winter address) so "Animal Kingdom" and special announcements can follow you.

It's not just the animals making sounds all over the Bronx Zoo these days—people are getting into the act. And as usual, the animals are having a hard time figuring out just what the human race is up to now.

It all began with a seemingly small and innocuous idea. Let's make up an animal sound quiz, we thought innocently, to amuse distinguished guests at Zoo luncheons. (Every Spring the Century Association, the University Club and the Coffee House Club schedule Zoo luncheons for their Members). And so we devised an animal sound quiz that everybody was happy about—until we tried it out for the first time.

Guests were asked to listen to a few animal sounds and choose, among three possibilities, the animal they felt might have made that sound. For example, we played a recording of the Great Horned Owl's hoot and listed these possible choices: Owl, Bushbaby, Yellow-breasted Chat. Another quiz sound was the brassy chatter of the Australian Laughing Jackass or Kookaburra, and we listed the choices as Kookaburra, Chattering Chachalaca, and Hyena.

Well . . . we *were* surprised at the results, because practically no one got anything right. (Of course, it must be remembered these Club Members were not Zoological Society Members). But another totally unpredictable thing happened: Just about everybody tied for winner with two right answers out of the possible 11!

That left only one thing to do and, smiling grimly and apologetically at our animals, we did it. We lined up all the tied winners and held a contest to determine who could make an animal sound—a hoot, hiss or a whoop—that sounded anything at all like the original.

The results were unforgettable.

For our part, we don't really dare to go too near the Owl Aviary—now that people have tried to horn in on that great owl's inimitable call.

MEMBERSHIP CHAIRMAN
THE ZOOLOGICAL PARK
New York 60, N. Y.

NEW YORK ZOOLOGICAL SOCIETY
FOUNDED 1895